

then treating the semiconductor wafers in a bath with an aqueous  $O_3$  solution only containing  $O_3$ ; and

*C2  
cancel*  
then treating the semiconductor wafers in a bath with an aqueous HCl solution only containing HCl with exposure to megasonic waves,

whereby these treatment steps form a treatment sequence  $B_2$ , which avoids the addition of fresh water or other liquids to the treatment baths.

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REMARKS ✓

At the outset, the Applicants wish to thank Patent Examiner Charlotte Brown for the many courtesies extended to the undersigned attorney during the personal interview on July 9, 2001. The substance of this interview is set forth in the Examiner Interview Summary, and in this Amendment. This will also make of record a telephone interview on, or about, July 20, 2001, with Patent Examiner Charlotte Brown during which the above amendments to the claims were discussed.

The amendments to this Patent Application are as follows:

Claims 1 and 11 have been amended to recite that in the first bath there is an aqueous HF solution only containing HF; and optionally HCl and optionally a surfactant; in the second bath there is an aqueous O<sub>3</sub> solution only containing O<sub>3</sub>; in the third bath there is an aqueous solution only containing HCl.

In view of the clear statement in the Specification on page 3, third paragraph, claim language should be allowable which is open to HCl and a surfactant as further ingredients, in the first bath of claims 1 and 11. The second bath contains no optional ingredients. The third bath contains no optional ingredients.

The Applicants comment upon the prior art rejection of the claims as follows: Reconsideration and withdrawal are respectfully requested for the rejection of claims 1-11 as being anticipated by, or in the alternative, as being obvious over *Pirooz EP 0701275*.

The arguments of the Patent Examiner against the amended claims of the present Patent Application are respectfully traversed.

The Patent Examiner argued that *Pirooz* teaches to firstly treat a semiconductor wafer with an HF solution and then add

O<sub>3</sub>, H<sub>2</sub>O<sub>2</sub> or HCl in water (cf. page 3 of the Office Action). This is an interpretation of the *Pirooz* reference which is not correct. What is really disclosed in *Pirooz* is to treat silicon wafers with a solution either containing HF and water or containing HF, water and HCl or containing HF, water and H<sub>2</sub>O<sub>2</sub> or containing HF, water and O<sub>3</sub>.

Contrary to the present invention, the *Pirooz* reference fails to disclose a treatment which is performed in sequence and which comprises three different baths containing (1) HF and water and (2) O<sub>3</sub> and water and HCl and water.

Since *Pirooz* neither anticipates the order of the claimed process sequence of steps nor all of the components used in this sequence of steps, the claimed method is clearly non-obvious in view of this prior art reference.

During the personal interview and during the telephone interview all of the above were pointed out to the Patent Examiner. The Patent Examiner stated that certain changes will be required to claims 1 and 11 in order to be consistent with the arguments that were presented during the telephone and the Personal Interviews. These arguments are that the prior art *Pirooz* reference fails to disclose three separate and distinct

treatment baths, wherein the first bath contains HF, the second bath contains ozone, and the third bath contains HCl. Thus, claims 1 and 11 are being amended to be consistent with these arguments so as to distinguish over *Pirooz*.

All of the other arguments for the patentability of the claimed invention, as set forth in the Amendment filed January 22, 2001, are herewith incorporated by reference.

For all of these reasons, it is firmly believed that this one prior art reference fails to provide an identical disclosure of the claimed invention. Hence the present invention is not anticipated under 35 U.S.C. 102. Withdrawal of this ground of rejection is respectfully requested.

In summary, claims 1 and 11 have been amended. In view of these amendments, it is firmly believed that the invention, and all the claims, are patentable under 35 U.S.C. 103 over the prior art reference applied by the Patent Examiner. A prompt notification of allowability is respectfully requested.

Respectfully submitted,

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Enclosures: (1) copy Petition for Two Month Extension of Time  
(2) Marked-Up Version of Amended Claims.

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231, on August 3, 2001.

Lisa L. Vulpis ✓  
Lisa L. Vulpis

MARKED-UP VERSION ✓  
OF AMENDED CLAIMS

Claim 1 (Three Times Amended):

A process for the wet chemical treatment of semiconductor wafers with treatment liquids in baths, comprising the steps of

firstly treating the semiconductor wafers in a bath with an aqueous HF solution only containing HF and optionally HCl and optionally a surfactant;

then treating the semiconductor wafers in a bath with an aqueous  $O_3$  solution only containing  $O_3$ ; and

then treating the semiconductor wafers in a bath with an aqueous HCl solution only containing HCl;

whereby these treatment steps form a treatment sequence B<sub>2</sub>, which avoids the addition of fresh water or other liquids to the treatment baths.

11. (Amended) A process for the wet chemical treatment of semiconductor wafers with treatment liquids in baths, comprising the steps of

firstly treating the semiconductor wafers in a bath with an aqueous HF solution only containing HF; and optionally HCl and optionally a surfactant;

then treating the semiconductor wafers in a bath with an aqueous  $O_3$  solution only containing  $O_3$ ; and

then treating the semiconductor wafers in a bath with an aqueous HCl solution only containing HCl with exposure to megasonic waves,

whereby these treatment steps form a treatment sequence  $B_2$ , which avoids the addition of fresh water or other liquids to the treatment baths.